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What are these brood bodies, and what structures do they represent? Evidently they are either metamorphosed buds or leaves. It may be conjectured that there was a time in the history of these plants when they were destitute of sporophytes, and that vegetative reproduction was the only means of their multiplication. Even at this day, were it not for this factor, our moss flora would dwindle away and become but a remnant of what it now is. By the action of winds, rains and snows, these brood bodies, as also stem segments and leaves, are not only loosened from their attachments, but are carried away, sometimes to considerable distances, and thus become effective not only in the propagation but in the dissemination as well, of the plants from which they were derived.

HYLOCOMIUMS OF THE NORTHEASTERN UNITED STATES.

BY ANNIE MORRILL SMITH.

Key to the species.

- | | |
|---|-----------------------|
| Leaves secund, sharply serrate at apex, costa long and single; alar cells quadrate, | 1. <i>rugosum</i> |
| Leaves not secund (equally spreading). | |
| Paraphyllia none. | |
| Leaves sulcate, bicostate; leaf cells enlarged at base, | 2. <i>triquetrum</i> |
| Leaves slightly sulcate, faintly bicostate or ecostate, a triangular patch of orange cells at angles, | 3. <i>parietinum</i> |
| Leaves not sulcate, faintly bicostate, alar cells somewhat enlarged and more hyaline, not inflated, suddenly recurved-squarrose at tip, | 4. <i>squarrosum</i> |
| Paraphyllia present. | |
| Leaves deeply sulcate, with long distinct double nerve, serrate in upper half, | 5. <i>umbratum</i> |
| Leaves obscurely bicostate; paraphyllia pinnate: branches 2-3 pinnate, | 6. <i>proliferum</i> |
| Leaves distinctly double nerved; paraphyllia minute: branches irregularly pinnate, | 7. <i>brevirostre</i> |
| Leaves one-nerved to middle, coarsely serrate, | 8. <i>Pyrenaicum</i> |

In the present study of *Hylocomiums*, eight species found in northeastern America have been included. Lesquereux & James' Manual cannot be followed in this genus. *H. rugosum* is there placed in the subgenus *Rhytidium*, *H. Schreberi* in the *Calliergon* group. I prefer to follow Limpricht and include the latter among the *Hylocomiums*, dropping also Lesquereux & James' subgenus *Pleurozium*, and counting all in one genus. *H. robustum* and *H. loreum* are of western range only, and are therefore omitted.

It is difficult to describe in words the differences which separate the *Hylocomiums* from the *Hypnum*s, but when once the general appearance of the plants is learned, one can readily see a strong family resemblance. They are of free and robust growth, loving both damp and shade as well as the open situations. Most of our species of *Hylocomiums* fruit sparingly or infrequently, the capsules maturing in late summer or autumn. *H. rugosum* never fruits with us, but fruits abundantly in the Klondike.

1. *H. rugosum* (Ehrh) De Not., is not very common, but is found in patches by itself, and can readily be identified by its second leaves, with

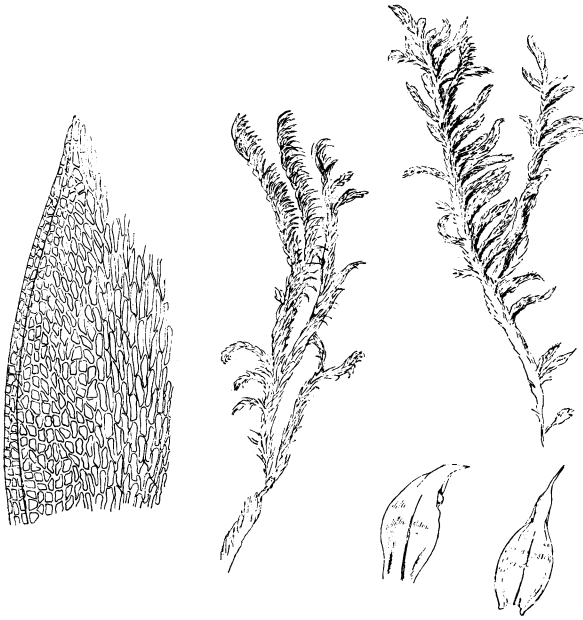


Fig. 1. *H. rugosum* x 1; leaves x 5; alar cells highly magnified.

long-pointed and serrate apex, and by the small alar cells, which are quite different from any of the other species. It has acute, spinulose papillae on the back of the leaf. Its favorite habitat seems to be on thin layers of soil on bluffs and ledges, though it is found on grassy banks in woods, and in mountain regions. Adirondack Mts., Bluffs of Lake Champlain, and around the lakes of central New York.

2. *H. triquetrum* (L.) B. & S., is the coarsest and most bushy of all the *Hylocomiums*, and is very common. It grows in loose tufts in pine woods on the ground, or on rocks in both very dry and very wet situations. Once known this moss is never overlooked. The leaves are large and spreading with a broad orange-colored insertion, as seen under the microscope. They have a strong double nerve, with stout papillae on the back.

3. *H. parietinum* Lindb. (*Hypnum Schreberi* Willd.), is by Lindberg as well as Limpricht, placed in the genus under consideration, and as it has a very decided likeness to the other species in the field, it is given here. The habit of growth is more slender than the preceding species the main stems being longer and the branches more pinnate. The nerve is very faint when present, and is either lacking or double. The point of distinction under the microscope is a small triangular patch of inflated orange cells at base of the leaf. It is a very common moss, found on rocks, ground and logs in damp woods. It somewhat resembles *Hypnum cuspidatum* in outward appearance.



Fig. 2. *Hylocomium triquetrum* $\times 1$; stem leaf $\times 4$.

4. *H. squarrosus* (L.) B. & S. has a more feathery look than *H. parietinum*, the leaves being thinner and more spreading (squarrose) on the stems, which are usually red, as are also those of *parietinum* and *proliferum*. The apices of the leaves are long and slender and reflexed. The

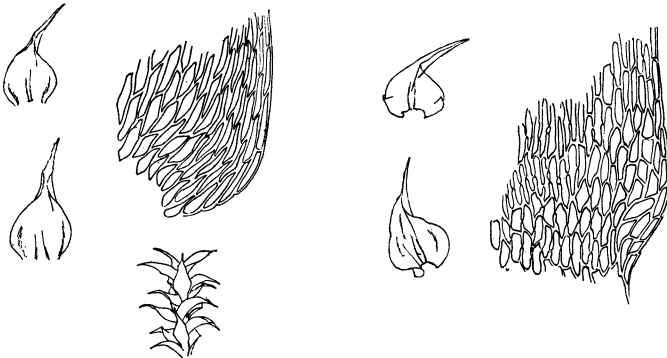


Fig. 3. On the left leaves of *H. squarrosus* $\times 5$; branch $\times 4$; alar cells highly magnified. On the right leaves of *H. triquetrum* $\times 5$; alar cells highly magnified showing pitted cell walls.

alar cells are somewhat larger and clearer, but are not inflated. The cells in this species are papillose, and the papillae are from the end walls of the

cells and not from their faces, as is more often the case in other genera. *H. squarrosus* is rather rare, growing in low swampy places in the Adirondacks, Berkshires, Green Mountains, White Mountains, and along the Massachusetts coast.

The preceding species are without paraphyllia; in the following they are highly developed.

5. *H. umbratum* (Ehrh.) B. & S. has dense paraphyllia, leaves rather small, sharply serrate to apex. They are deeply sulcate or folded, with a strong double nerve. It varies in outward looks, having somewhat the habit of *proliferum*. In the field one would be more apt to confound it with *Pyrenaicum* though this last is a larger and coarser plant. *H. umbratum* is a moss of cool moist mountain woods, and is usually abundant, growing on rocks and ground in wet places in deep woods above 2,000 feet.

6. *H. proliferum* (L.) Lindb. (*H. splendens* B. & S.) is as easily recognized as *H. triquetrum* when once in mind, it having a most distinct habit. The branches are tri-pinnate and closely set, giving it a similar look to some forms of *umbratum*, but its mode of growth is somewhat unusual, and could

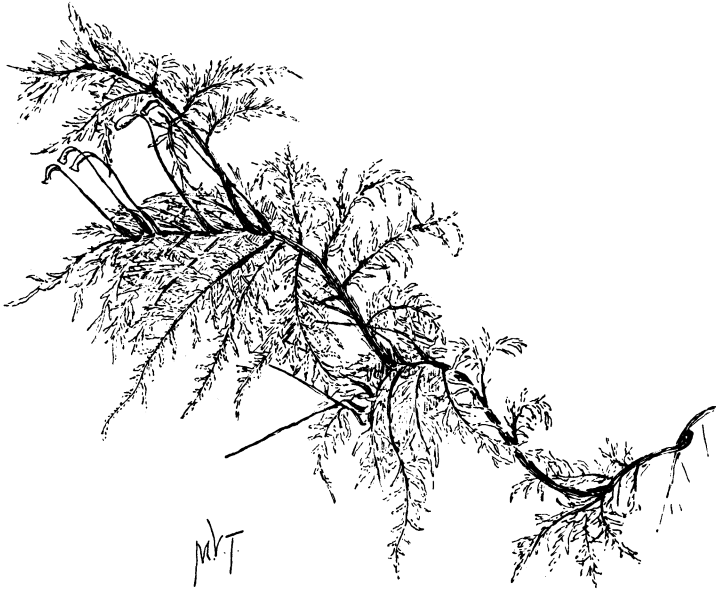


Fig. 4. *Hylocomium proliferum* x 1.

not be mistaken for any other species of the genus. The paraphyllia are small and pinnate. We also find spinulose papillae on the back of the leaves. The moss is common on dead trees and fallen logs in moist, cool woods. Its delicate color and feathery aspect makes it our most showy and beautiful *Hylocomium*.

7. *H. brevirostre* (Ehrh.) B. & S. is a larger moss, with more irregularly pinnate mode of branching and the serration of the leaf more conspicuous than in the following species, which it somewhat resembles when dried. In the field it would be more often mistaken for *squarrosus*, because of its spreading but not reflexed leaves. It is not common.

8. *H. Pyrenaicum* (Spruce) Lindb. is a synonym for *Hypnum Oakesii* Sulliv. In this species the serration of leaf is decided but fine, the nerve is distinctly single to the middle of the leaf, the cells are papillose, and uniform to the colored base of insertion on the stem. It grows on old logs and on earth in cool, damp woods.

The distinctions between species are well given in Dixon & Jameson's Handbook of British mosses, in the fine print. This is still our only available Handbook covering the whole field, as the Lesquereux & James Manual is superseded by more recent works. Husnot's Muscologia Gallica, is complete, and is useful for reference. In Rabenhorst's Kryptogamen-Flora the mosses by Limpricht have just reached the *Hylocomiums*, which have not yet been issued. Braithwaite's British Moss-Flora, so valuable in many genera, has only begun on the Hypnaceae. Dr. Grout's book "Mosses with a Hand-Lens" is now ready for the use of beginners, and we hope other more advanced works will follow.

ILLUSTRATED GLOSSARY—Concluded.

The researches of Philibert have shown that the endostome, not the exostome, corresponds to the peristome of the mosses having a single row of teeth.

Processes, see under *peristome*.

Rostellate, (of the operculum) with a short beak.

Rostrate, (of the operculum) with a long beak. [Figs. 30 and 32.]

Rough, same as *papillose*.

Scabrous, same as *papillose*.

Segments see *peristome*.

Seta, the stalk on which the capsule is borne. [Figs. 30, 35, and 40.]

Sporangium, often applied to the capsule, but by some authors restricted to the spore-sac, or inner sac of the capsule containing the spores.

Spores, small round bodies contained in the capsule, serving the purpose of seeds, but in no way homologous with them. [Fig. 43, *e*.]

Sporogonium, the sporophyte or spore bearing part of the moss.

Stegocarpous, having the capsule operculate.

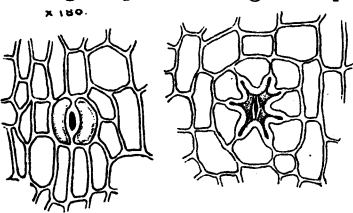


Fig. 44.

Fig. 44a.

Stomata, spores in the walls of capsules, surrounded by special guard-cells and serving the same purpose as the stomata in the epidermis of the leaves of the flowering plants. They may be superficial as in Fig. 44, or immersed, i. e. sunken and nearly covered by other cells as in Fig. 44a.